

Remote Sensing of Terrestrial Water Storage with GRACE and Future Gravimetry Missions

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The Gravity Recovery and Climate Experiment (GRACE) has demonstrated that satellite gravimetry can be a valuable tool for regional to global water cycle observation. Studies of ice sheet and glacier mass losses, ocean bottom pressure and circulation, and variability of water stored on and in the land including groundwater all have benefited from GRACE observations, and the list of applications and discoveries continues to grow. As the mission approaches its tenth anniversary of launch on March 12, 2012, it has nearly doubled its proposed lifetime but is showing some signs of age. In particular, degraded battery capacity limits the availability of power in certain orbital configurations, so that the accelerometers must be turned off for approximately one month out of six. The mission managers have decided to operate the spacecrafts in a manner that maximizes the remaining lifetime, so that the longest possible climate data record is available from GRACE. Nevertheless, it is not unlikely that there will be a data gap between GRACE and the GRACE Follow On mission, currently proposed for launch in 2016. In this presentation we will describe recent GRACE enabled science, GRACE mission health, and plans for GRACE Follow On and other future satellite gravimetry missions.

GRACE-FO

GRACE II

e.motion (European proposal)

improved accelerometers

multiple satellite pairs / constellation